

Application No.: 10/524,827
After Allowance Under 37 C.F.R. 1.312

Docket No: 13173-00006-US



AMENDMENTS TO THE CLAIMS

Listing of Claims:

1. (Currently amended) A process for preparing ketocarotenoids by cultivating a genetically transformed plant which, compared with an untransformed wild type plant, has an introduced or increased ketolase activity caused by transformation with a polynucleotide encoding a ketolase comprising the amino acid sequence of SEQ ID NO: 2 or a sequence which is derived from this sequence by substitution, insertion or deletion of amino acids and which has an identity of at least 95% at the amino acid level with the sequence of SEQ ID NO: 2; wherein said transformed plant produces ketocarotenoids and the ketocarotenoids are harvested.

2-8. (Cancelled)

9. (Previously presented) The process as claimed in claim 1, wherein the plant is additionally transformed with a polynucleotide encoding a polypeptide that introduces or increases the activity, compared with the untransformed wild type plant, of at least one of the activities selected from the group of hydroxylase activity and β -cyclase activity.

10-11. (Cancelled)

12. (Currently amended) The process as claimed in claim 9, wherein the polynucleotide which encodes a hydroxylase comprises the amino acid sequence of SEQ ID NO: 16 or a sequence which is derived from this sequence by substitution, insertion or deletion of amino acids and which has an identity of at least 95% at the amino acid level with the sequence of SEQ ID NO: 16.

13. (Previously presented) The process as claimed in claim 12, wherein the polynucleotide comprises the sequence of SEQ ID NO: 15.

Application No.: 10/524,827
After Allowance Under 37 C.F.R. 1.312

Docket No: 13173-00006-US

14. (Currently amended) The process as claimed in claim 9, wherein ~~nucleic acids~~ the polynucleotide which ~~encode~~ encodes a β -cyclase ~~comprising~~ comprises the amino acid sequence of SEQ ID NO: 18 or a sequence which is derived from this sequence by substitution, insertion or deletion of amino acids and which has an identity of at least 95% at the amino acid level with the sequence of SEQ ID NO: 18 ~~are introduced as nucleic acid encoding a β -cyclase.~~

15. (Previously presented) The process as claimed in claim 14, wherein the polynucleotide comprises the sequence of SEQ ID NO: 17.

16-21. (Cancelled)

22. (Previously presented) The process as claimed in claim 1, wherein a plant selected from the families Ranunculaceae, Berberidaceae, Papaveraceae, Cannabaceae, Rosaceae, Fabaceae, Linaceae, Vitaceae, Brassicaceae, Cucurbitaceae, Primulaceae, Caryophyllaceae, Amaranthaceae, Gentianaceae, Geraniaceae, Caprifoliaceae, Oleaceae, Tropaeolaceae, Solanaceae, Scrophulariaceae, Asteraceae, Liliaceae, Amaryllidaceae, Poaceae, Orchidaceae, Malvaceae, Iliaceae or Lamiaceae is used as plant.

23. (Previously presented) The process as claimed in claim 22, wherein a plant selected from the plant genera Marigold, Tagetes erecta, Tagetes patula, Acacia, Aconitum, Adonis, Arnica, Aquilegia, Aster, Astragalus, Bignonia, Calendula, Caltha, Campanula, Canna, Centaurea, Cheiranthus, Chrysanthemum, Citrus, Crepis, Crocus, Curcubita, Cytisus, Delonia, Delphinium, Dianthus, Dimorphotheca, Doronicum, Eschscholtzia, Forsythia, Fremontia, Gazania, Gelsemium, Genista, Gentiana, Geranium, Gerbera, Geum, Grevillea, Helenium, Helianthus, Hepatica, Heracleum, Hibiscus, Heliopsis, Hypericum, Hypochoeris, Impatiens, Iris, Jacaranda, Kerria, Laburnum, Lathyrus, Leontodon, Lilium, Linum, Lotus, Lycopersicon, Lysimachia, Maratia, Medicago, Mimulus, Narcissus, Oenothera, Osmanthus, Petunia, Photinia, Physalis, Phyteuma, Potentilla, Pyracantha, Ranunculus, Rhododendron, Rosa, Rudbeckia, Senecio, Silene, Silphium, Sinapsis, Sorbus, Spartium, Tecoma, Torenia, Tragopogon, Trollius, Tropaeolum, Tulipa, Tussilago, Ulex, Viola or Zinnia is used as plant.

Application No.: 10/524,827
After Allowance Under 37 C.F.R. 1.312

Docket No: 13173-00006-US

24. (Previously presented) The process as claimed in claim 1, wherein the ketocarotenoids are selected from the group of astaxanthin, canthaxanthin, echinenone, 3-hydroxyechinenone, 3'-hydroxyechinenone, adonirubin and adonixanthin.

25. (Previously presented) The genetically transformed plant of claim 1.

26-29. (Cancelled)

30. (Previously presented) The genetically transformed plant of claim 12.

31-34. (Cancelled)

35. (Currently amended) The genetically transformed plant as claimed in claim 25[[or 30]], wherein the plant is selected from the families Ranunculaceae, Berberidaceae, Papaveraceae, Cannabaceae, Rosaceae, Fabaceae, Linaceae, Vitaceae, Brassiceae, Cucurbitaceae, Primulaceae, Caryophyllaceae, Amaranthaceae, Gentianaceae, Geraniaceae, Caprifoliaceae, Oleaceae, Tropaeolaceae, Solanaceae, Scrophulariaceae, Asteraceae, Liliaceae, Amaryllidaceae, Poaceae, Orchidaceae, Malvaceae, Illiaceae or Lamiaceae.

36. (Previously presented) The genetically modified plant as claimed in claim 35, wherein the plants are selected from the plant genera Marigold, Tagetes erecta, Tagetes patula, Acacia, Aconitum, Adonis, Arnica, Aquilegia, Aster, Astragalus, Bignonia, Calendula, Caltha, Campanula, Canna, Centaurea, Cheiranthus, Chrysanthemum, Citrus, Crepis, Crocus, Curcubita, Cyt isus, Delonia, Delphinium, Dianthus, Dimorphotheca, Doronicum, Eschscholtzia, Forsythia, Fremontia, Gazania, Gelsemium, Genista, Gentiana, Geranium, Gerbera, Geum, Grevillea, Helenium, Helianthus, Hepatica, Heracleum, Hibiscus, Heliopsis, Hypericum, Hypochoeris, Impatiens, Iris, Jacaranda, Kerria, Laburnum, Lathyrus, Leontodon, Lilium, Linum, Lotus, Lycopersicon, Lysimachia, Maratia, Medicago, Mimulus, Narcissus, Oenothera, Osmanthus, Petunia, Photinia, Physalis, Phyteuma, Potentilla, Pyracantha, Ranunculus, Rhododendron, Rosa, Rudbeckia, Senecio, Silene, Silphium, Sinapsis, Sorbus,

Application No.: 10/524,827
After Allowance Under 37 C.F.R. 1.312

Docket No: 13173-00006-US

Spartium, Tecoma, Torenia, Tragopogon, Trollius, Tropaeolum, Tulipa, Tussilago, Ulex, Viola or Zinnia.

37. (Previously presented) The genetically transformed plant as claimed in claim 25, where the plant is used as animal or human food.

38. (Currently amended) The genetically transformed plant as claimed in claim 25, where the plant produces ketocarotenoid-containing extracts or animal ~~and~~ or human food supplements.

39-46. (Cancelled)

47. (Previously presented) The process as claimed in claim 22, wherein the plant is a plant from the family Asteraceae.

48. (Previously presented) The process as claimed in claim 23, wherein the plant is Tagetes erecta.

49. (Previously presented) The process as claimed in claim 1, wherein the nucleic acid encoding a ketolase comprises the amino acid sequence of SEQ ID NO: 2.

50. (Previously presented) The process as claimed in claim 1, wherein the nucleic acids which encode ketolases comprise the amino acid sequence of SEQ ID NO: 2.

51. (Currently amended) The process as claimed in claim 12, wherein the nucleic acids which encode a hydroxylase comprise the amino acid sequence of SEQ ID NO: 16.

52. (Currently amended) The process as claimed in claim 14, wherein the nucleic acids which encode a β -cyclase comprise the amino acid sequence of SEQ ID NO: 18.

53. (Previously presented) The genetically transformed plant of claim 14.

Application No.: 10/524,827
After Allowance Under 37 C.F.R. 1.312

Docket No: 13173-00006-US

54. (Previously presented) The genetically transformed plant as claimed in claim 30, where the plant is used as animal or human food.

55. (Currently amended) The genetically transformed plant as claimed in claim 30, where the plant produces ketocarotenoid-containing extracts or animal ~~and~~ or human food supplements.

56. (New) The genetically transformed plant as claimed in claim 53, where the plant is used as animal or human food.

57. (New) The genetically transformed plant as claimed in claim 53, where the plant produces ketocarotenoid-containing extracts or animal or human food supplements.

58. (New) The genetically transformed plant as claimed in claim 30, wherein the plant is selected from the families Ranunculaceae, Berberidaceae, Papaveraceae, Cannabaceae, Rosaceae, Fabaceae, Linaceae, Vitaceae, Brassicaceae, Cucurbitaceae, Primulaceae, Caryophyllaceae, Amaranthaceae, Gentianaceae, Geraniaceae, Caprifoliaceae, Oleaceae, Tropaeolaceae, Solanaceae, Scrophulariaceae, Asteraceae, Liliaceae, Amaryllidaceae, Poaceae, Orchidaceae, Malvaceae, Iliaceae or Lamiaceae.

59. (New) The genetically modified plant as claimed in claim 58, wherein the plants are selected from the plant genera Marigold, Tagetes erecta, Tagetes patula, Acacia, Aconitum, Adonis, Arnica, Aquilegia, Aster, Astragalus, Bignonia, Calendula, Caltha, Campanula, Canna, Centaurea, Cheiranthus, Chrysanthemum, Citrus, Crepis, Crocus, Curcubita, Cytisus, Delonia, Delphinium, Dianthus, Dimorphotheca, Doronicum, Esch scholtzia, Forsythia, Fremontia, Gazania, Gelsemium, Genista, Gentiana, Geranium, Gerbera, Geum, Grevillea, Helenium, Helianthus, Hepatica, Heracleum, Hibiscus, Heliopsis, Hypericum, Hypochoeris, Impatiens, Iris, Jacaranda, Kerria, Laburnum, Lathyrus, Leontodon, Lilium, Linum, Lotus, Lycopersicon, Lysimachia, Maratia, Medicago, Mimulus, Narcissus, Oenothera, Osmanthus, Petunia, Photinia, Physalis, Phyteuma, Potentilla, Pyracantha, Ranunculus, Rhododendron, Rosa, Rudbeckia, Senecio, Silene, Silphium, Sinapsis, Sorbus, Spartium, Tecoma, Torenia, Tragopogon, Trollius, Tropaeolum, Tulipa, Tussilago, Ulex, Viola or Zinnia.

Application No.: 10/524,827
After Allowance Under 37 C.F.R. 1.312

Docket No: 13173-00006-US

60. (New) The genetically transformed plant as claimed in claim 53, wherein the plant is selected from the families Ranunculaceae, Berberidaceae, Papaveraceae, Cannabaceae, Rosaceae, Fabaceae, Linaceae, Vitaceae, Brassiceae, Cucurbitaceae, Primulaceae, Caryophyllaceae, Amaranthaceae, Gentianaceae, Geraniaceae, Caprifoliaceae, Oleaceae, Tropaeolaceae, Solanaceae, Scrophulariaceae, Asteraceae, Liliaceae, Amaryllidaceae, Poaceae, Orchidaceae, Malvaceae, Iliaceae or Lamiaceae.

61. (New) The genetically modified plant as claimed in claim 60, wherein the plants are selected from the plant genera Marigold, Tagetes erecta, Tagetes patula, Acacia, Aconitum, Adonis, Arnica, Aquilegia, Aster, Astragalus, Bignonia, Calendula, Caltha, Campanula, Canna, Centaurea, Cheiranthus, Chrysanthemum, Citrus, Crepis, Crocus, Curcubita, Cytisus, Delonia, Delphinium, Dianthus, Dimorphotheca, Doronicum, Eschscholtzia, Forsythia, Fremontia, Gazania, Gelsemium, Genista, Gentiana, Geranium, Gerbera, Geum, Grevillea, Helenium, Helianthus, Hepatica, Heracleum, Hibiscus, Heliopsis, Hypericum, Hypochoeris, Impatiens, Iris, Jacaranda, Kerria, Laburnum, Lathyrus, Leontodon, Lilium, Linum, Lotus, Lycopersicon, Lysimachia, Maratia, Medicago, Mimulus, Narcissus, Oenothera, Osmanthus, Petunia, Photinia, Physalis, Phyteuma, Potentilla, Pyracantha, Ranunculus, Rhododendron, Rosa, Rudbeckia, Senecio, Silene, Silphium, Sinapsis, Sorbus, Spartium, Tecoma, Torenia, Tragopogon, Trollius, Tropaeolum, Tulipa, Tussilago, Ulex, Viola or Zinnia.